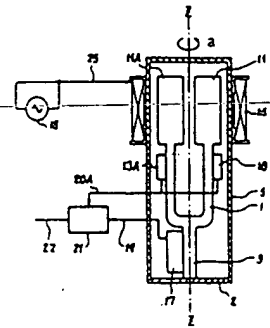


(54) GYROSCOPE DEVICE  
 (11) 61-102512 (A) (43) 21.5.1986 (19) JP  
 (21) Appl. No. 59-224753 (22) 25.10.1984  
 (71) TOKYO KEIKI CO LTD (72) MICHIO FUKANO(1)  
 (51) Int. Cl. G01C19/56//G01P9/04

**PURPOSE:** To prevent variation in scale factor and deviation in zero point by arranging a driving coil so that a magnetic field produced with an AC current becomes parallel to an input axis Z-Z.

**CONSTITUTION:** When the AC current is flowed from a driving power source 16 to the driving coil 14, a center magnetic field coincides with the axis Z-Z. Then, both leg parts 11A and 11 of a tuning fork 1 are induced in every half cycle with the produced magnetic field to the same polarity S or N, so they generate repulsive forces. Thus, a repulsive force is generated twice in every AC cycle, so the tuning fork 1 oscillates at a frequency twice as high as that of the power source 16. Oscillations of both legs 11A and 11 are detected by oscillation detectors 18 and 18A and angular oscillations of the inflection shaft 3 of the tuning fork 1 is rectified synchronously on the basis of the detection outputs to detect an angular speed  $\Omega$ . The driving force which causes the tuning fork 1 to oscillate is only the repulsive forces of the legs 11 and 11A and does not relate to the position of the coil 14. Therefore, variation in scale factor and deviation in zero point corresponding to variations in the voltage and frequency of the power source 16 are prevented or reduced greatly.

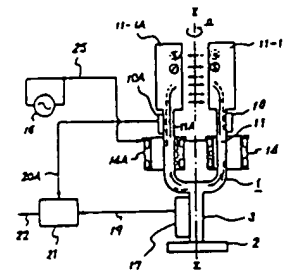


2: base, 3: external housing, 17: angular oscillation detector.  
 21: demodulator, a: angular speed  $\Omega$

(54) GYROSCOPE DEVICE  
 (11) 61-102513 (A) (43) 21.5.1986 (19) JP  
 (21) Appl. No. 59-224754 (22) 25.10.1984  
 (71) TOKYO KEIKI CO LTD (72) TAKESHI HOJO(1)  
 (51) Int. Cl. G01C19/56//G01P9/04

**PURPOSE:** To prevent variation in scale factor and deviation in zero point by arranging a driving coil so that a magnetic field produced with an AC current makes one round of oscillators in series.

**CONSTITUTION:** Driving coils 14 and 14A are arranged under a couple of legs 11 and 11A and coils 14 and 14A are connected in series to flow an AC current. At this time, one of oscillation mass parts 11-1 and 11-1A of both legs 11 and 11A becomes an N pole and the other becomes an S pole at every half cycle of the AC current, so that they receives mutually attracting forces. Therefore, both legs attract each other twice in every cycle of the AC current, so a tuning fork 1 oscillates at a frequency twice as high as that of an AC power source 16. At this time, oscillations of both legs 11A and 11 are detected by oscillation detectors 18 and 18A and angular oscillations of the inflection shaft 3 of the tuning fork 1 is rectified synchronously on the basis of the detection outputs to detect an angular speed  $\Omega$ . The driving force which causes the tuning fork 1 to oscillate is only the attracting force between both legs 11 and 11A, so that variation in scale factor and deviation in zero point corresponding to variations in the voltage and frequency of the power source are prevented or reduced greatly.

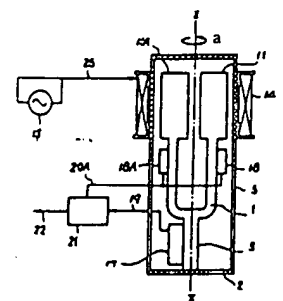


2: base, 17: angular oscillation detector, 19: cable way,  
 21: demodulator

(54) GYROSCOPE DEVICE  
 (11) 61-102514 (A) (43) 21.5.1986 (19) JP  
 (21) Appl. No. 59-224755 (22) 25.10.1984  
 (71) TOKYO KEIKI CO LTD (72) TAKESHI HOJO(3)  
 (51) Int. Cl. G01C19/56//G01P9/04

**PURPOSE:** To stabilize an output and to improve precision by using the output of an oscillation detector as the reference phase of a demodulator.

**CONSTITUTION:** A driving coil 14 is driven with an AC current from a power source 16 and both legs 11 and 11A of a tuning fork 1 oscillate. Oscillations of both legs 11 and 11A at this time are detected by oscillation detectors 18 and 18A, whose detection outputs are used as the reference phase to rectify angular oscillations of the inflection shaft 3 of the tuning fork 1 synchronously by the demodulator 21, detecting an angular speed  $\Omega$ . The reference signal of the demodulator 21 is based upon not the phase of the power source 16, but the output phase of the detectors 18 and 18A. The generated voltages of the detectors 18 and 18A have phases of dynamical oscillation and invariably constant phase relation with angular oscillations around the inflection shaft 3 having the same dynamical oscillation phase. Therefore, even if a transient phenomenon occurs to the dynamical system, exactly the same phase relation is born between the oscillations of the tuning fork 1 and the angular oscillations, so the output is stabilized and the precision is improved.



18: oscillation detector